16.T.2 Trauma Manual - Primary Survey

Trauma Call Criteria
A Trauma Call is made by calling the switchboard urgently on 777 and saying "Trauma in Children's Emergency".
A Trauma Call should be made in the following situations - High risk mechanism of injury, Abnormal vital signs and Types of injuries.

High Risk Mechanism of Injury
- Vehicular crash > 60 km/hour
- Major deformation of vehicle
- Fatal injury in same vehicle
- Fall from height > 5 metres
- Patient ejected from vehicle
- Cyclist/pedestrian hit by vehicle > 30 km/hour
- Injuries to multiple body regions

Vital Signs
- Respiratory distress - Rate < 10 or > 30 or cyanosis
- No palpable radial pulse in children or systolic BP < 90 in adults
- Any depression of level of consciousness in children or requires at least "shake and shout" to arouse or falling level of consciousness in adults

Injuries
- Serious trauma to: any body region
- Burns partial or full > 10% in children, 20% in adults

Serious trauma refers to:
Penetrating injury of: head, neck, chest, abdomen, perineum, back.
Head: 1 or 2 dilated pupils, open head injury, severe facial injury
Chest: Subcutaneous emphysema, major flail segment.
Abdomen: Distension, rigidity.
Spine: Weakness, sensory loss
Limb: Vascular injury with ischaemia of limb, amputation, crush injury of limb or trunk, bilateral femur fractures.

During the primary survey life-threatening conditions are identified and are treated immediately. The survey should be rapid and thorough. Frequent reassessment is necessary to determine the response to treatment and to detect later deterioration.
The order of the primary survey is:

A - Airway including cervical spine control
B - Breathing
C - Circulation
D - Disability (Neurological)
E - Exposure

**Airway**

**Assessment**

1. Look, listen and feel for air movement.
2. Check for abnormal sounds - stridor, gurgling, hoarseness
3. Briefly assess level of consciousness.

**Management**

1. Maintain in-line cervical immobilisation
2. Jaw thrust or chin lift manoeuvre
3. Suction airway
4. Oropharyngeal airway
5. Endotracheal intubation

Cervical Immobilisation:

Maintain cervical spine in the neutral position by one of these methods:

- In-line bimanual stabilisation or
- Semi-rigid collar of correct size or
- Sandbags and adhesive tape.

**Indications for Endotracheal Intubation:**

- Apnoea
- Respiratory failure
- GCS < 8 or Unprotected airway
- Upper airway obstruction
- Suspected raised intracranial pressure

**Breathing**

**Assessment**

1. Expose the chest
2. Observe rate and effort of respiration
3. Inspect and palpate chest wall for abnormal movement/injury
4. Check tracheal position
5. Auscultate the chest.
Management
1. Give 100% oxygen via mask at 10 L/min
2. Assist ventilation with bag-valve-mask
3. Treat cause of respiratory compromise.

Common Causes of Respiratory Compromise:

**Tension Pneumothorax**
- Do not wait for a chest x-ray.
- Immediately perform a needle thoracocentesis - Insert a large cannula (14-16 Gauge) in the 2nd intercostal space in the midclavicular line. Leave open to air.
- Follow with a large intercostal catheter. 5th intercostal space, anterior axillary line.

**Haemothorax**
- Fluid resuscitation prior to insertion of a large intercostal catheter.

**Flail Chest with Pulmonary Contusion**
- Need for ventilation depends on degree of respiratory compromise

**Open Pneumothorax**
- Cover wound with a sterile dressing, secured on three sides.
- Insert intercostal catheter.

### Circulation

**Assessment**
1. Check skin temperature, colour and capillary refill time.
2. Assess pulse rate and quality.
3. Identify exsanguinating haemorrhage.

**Management**
1. Control bleeding with external pressure.
2. Insert two large intravenous lines into large veins.
3. Insert an intraosseous needle if delay > 2 minutes in achieving vascular access.
4. Take blood for Cross-match, Haematology and Biochemistry.
5. Administer volume replacement if circulatory compromise. Initial bolus 20 mL/kg.
6. Repeat 20 mL/kg of volume replacement if no response or relapse.
7. Give blood if persistent circulatory compromise.

**Resuscitation Fluid**
- Either colloid or crystalloid may be used for fluid resuscitation. Choices include Haemaccel, 5% Albumin, Hartmann’s solution or Normal saline. Do not use dextrose-containing fluids.
- After 40 mL/kg of colloid or crystalloid has been used, blood products should be considered
Blood tests:

- Cross-match. At least 2 mL in clotted "Blood Bank" tube.
- Haematology. Full blood count.
- Biochemistry. EUC, Amylase, BSL, LFT.
- Blood alcohol if 15 years or older.

Disability (Neurological)
Assessment:
1. Determine level of consciousness using AVPU.
   A - Alert
   V - Responsive to vocal stimulus
   P - Responsive to painful stimulus
   U - Unresponsive
2. Pupillary size and reaction
3. Asymmetry of limb movement

Management
Ensure optimal management of ABC.

Exposure
Management:
1. Remove all clothing

Monitoring
ECG monitor
Pulse oximeter
End-tidal CO2 monitor (if intubated)
Non-invasive blood pressure

Urinary and Gastric Catheters
A urinary catheter should be inserted, particularly in patients with circulatory compromise, head injury or requiring ventilation. Contraindications are the presence of blood at the urethral meatus, perineal/scrotal haematoma or pelvic fracture.
A large orogastric tube should be inserted, particularly in severe trauma, head injury, abdominal injury, ventilated patients. The gastric tube should be aspirated frequently and left on free drainage.

Radiology
All children at risk of significant injury should have the following x-rays performed urgently in the Emergency Department.
- Lateral cervical spine (with caudal arm traction)
- Chest
- Pelvis